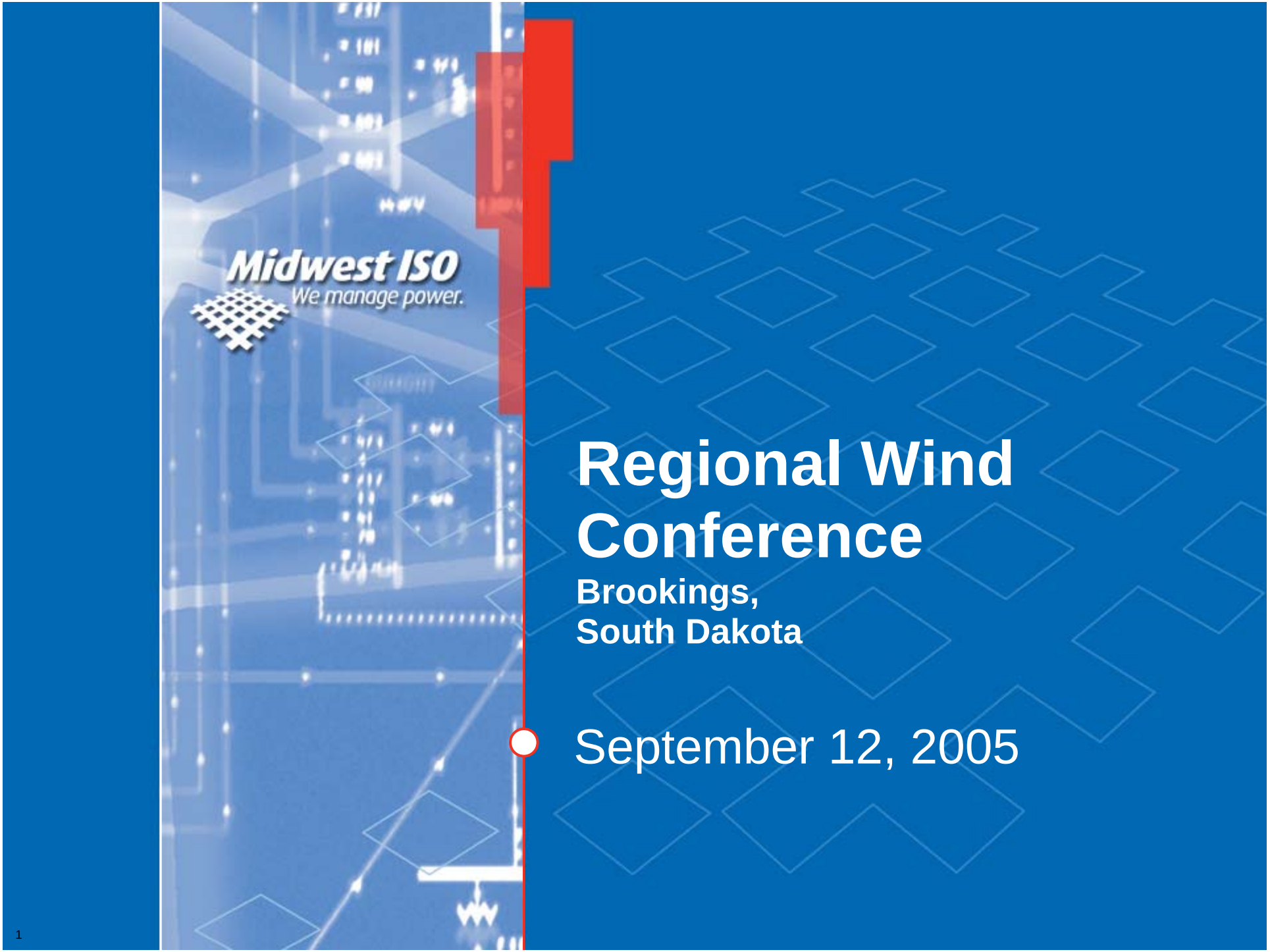


Regional Wind Conference

Brookings,
South Dakota

September 12, 2005

Introduction

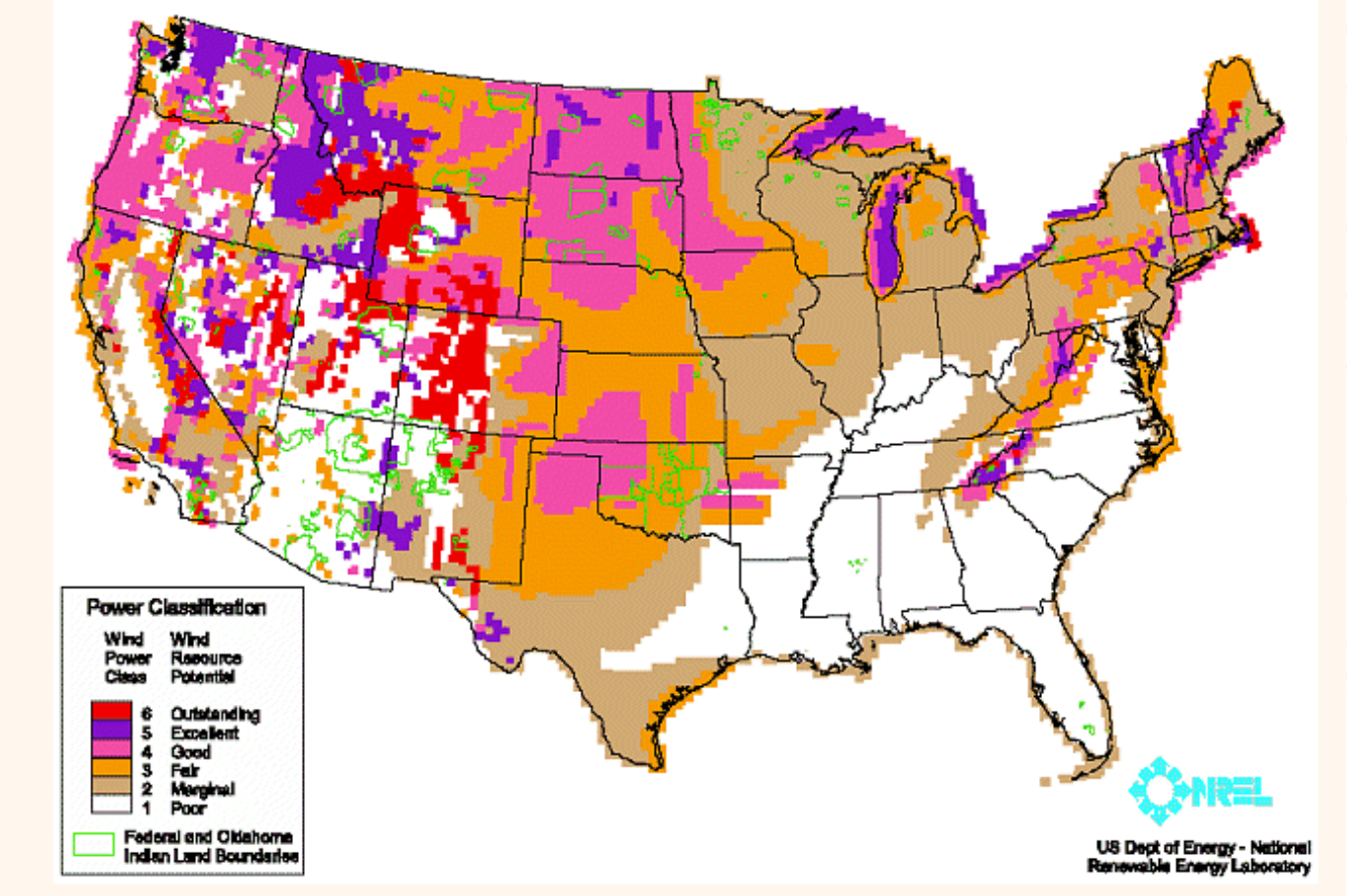
- Dale Osborn

Transmission Technical Director
Midwest ISO

Vice Chair
IEEE Wind Power Coordinating Committee

dosborn@midwestiso.org

Wind Resource Potential



	WIND POWER (MW) X 1000 MW	
State	**Existing[1]**	**Total Potential[2]**
Illinois	**.05**	**7**
Iowa	**.47**	**63**
Minnesota	**.56**	**75**
Nebraska	**.01**	**99**
North Dakota Table 1 - Wind Resource Availability	**.07**	**138**
South Dakota	**.04**	**117**
Wisconsin	**.05**	**6**
Total	**1.3**	**506**

Notes:

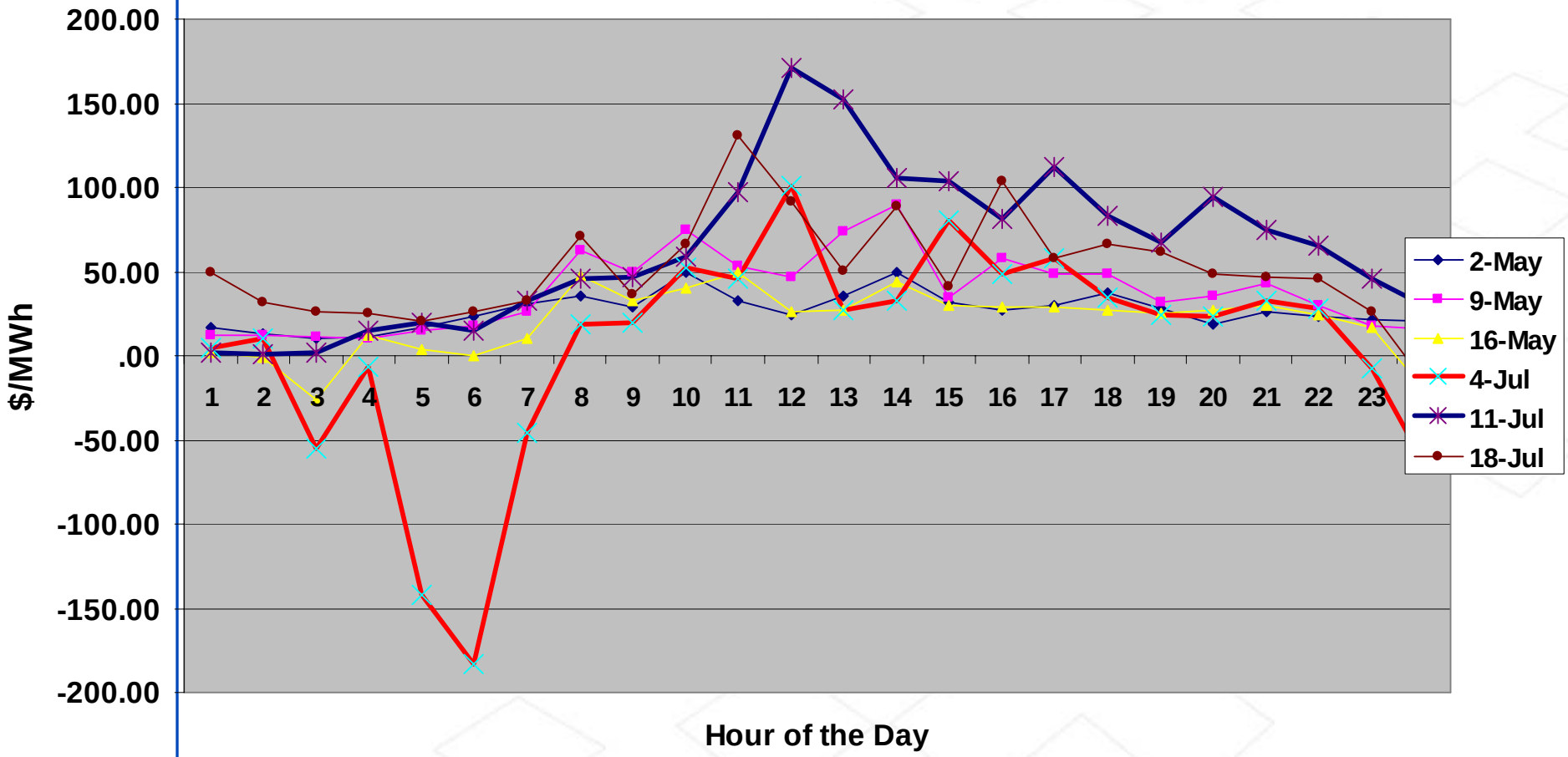
[1] Nameplate MW, American Wind Energy Association, January 2004. http://www.awea.org/

[2] Average MW, circa 33% of nameplate capacity, sourced from "An Assessment of Windy Land Area and Wind Energy Potential", Pacific Northwest Laboratory, 1991. Source: Wind on the Wires presentation on Net Environmental Impacts of Transmission Systems in the Midwest.

SD Barriers to Wind

- Supply and Demand
  - 506,000 MW of Supply
  - 5,000 MW of demand in MAPP
  - 8,000 MW if add Wisconsin
  - 18,000 MW for all of MISO 10% REO
  - 130,000 for all US at 10% REO

LMP Sample Sioux Falls



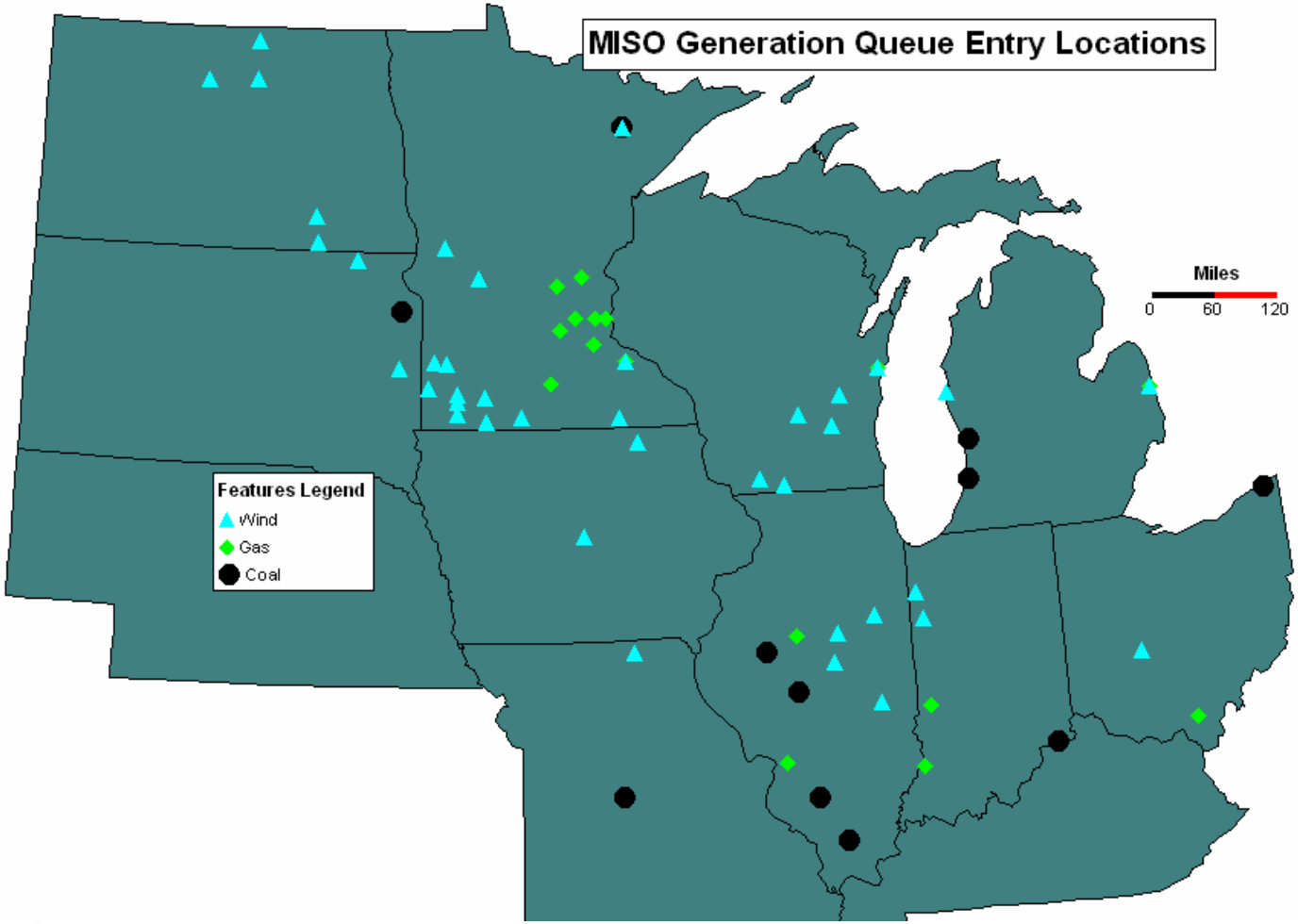
Day Ahead, Spot Market Information

- http://www.midwestmarket.org/
- Data only from April
- Every year is atypical
  - Hot
  - Low water levels for WAPA
  - Coal shortage
  - New Market

Barriers to Wind Energy

- Transmission availability where wind has been proposed or located
  - Locate wind generation near substations - new substations cost money, new lines cost money
  - Build new transmission from prime wind locations
    - Queue process
    - Grouped process
    - Collector systems
  - Voltage selection limiting to capacity, economics
- Parochial attitudes- my wind my state
- Economics
  - Cost of wind compared to other neighboring resources
  - REO, RPS

Generation Queue Entries



Midwest ISO
We manage power.

A Vision for Transmission Infrastructure Investments

Realizing the CapX 2020 Vision

Information Briefing – Moving to Implementation

18 July 2005

Central Minnesota Municipal Power Agency

Great River Energy

minnesota power
An ALLETE Company

Minnkota Power
MPC Cooperative, Inc.

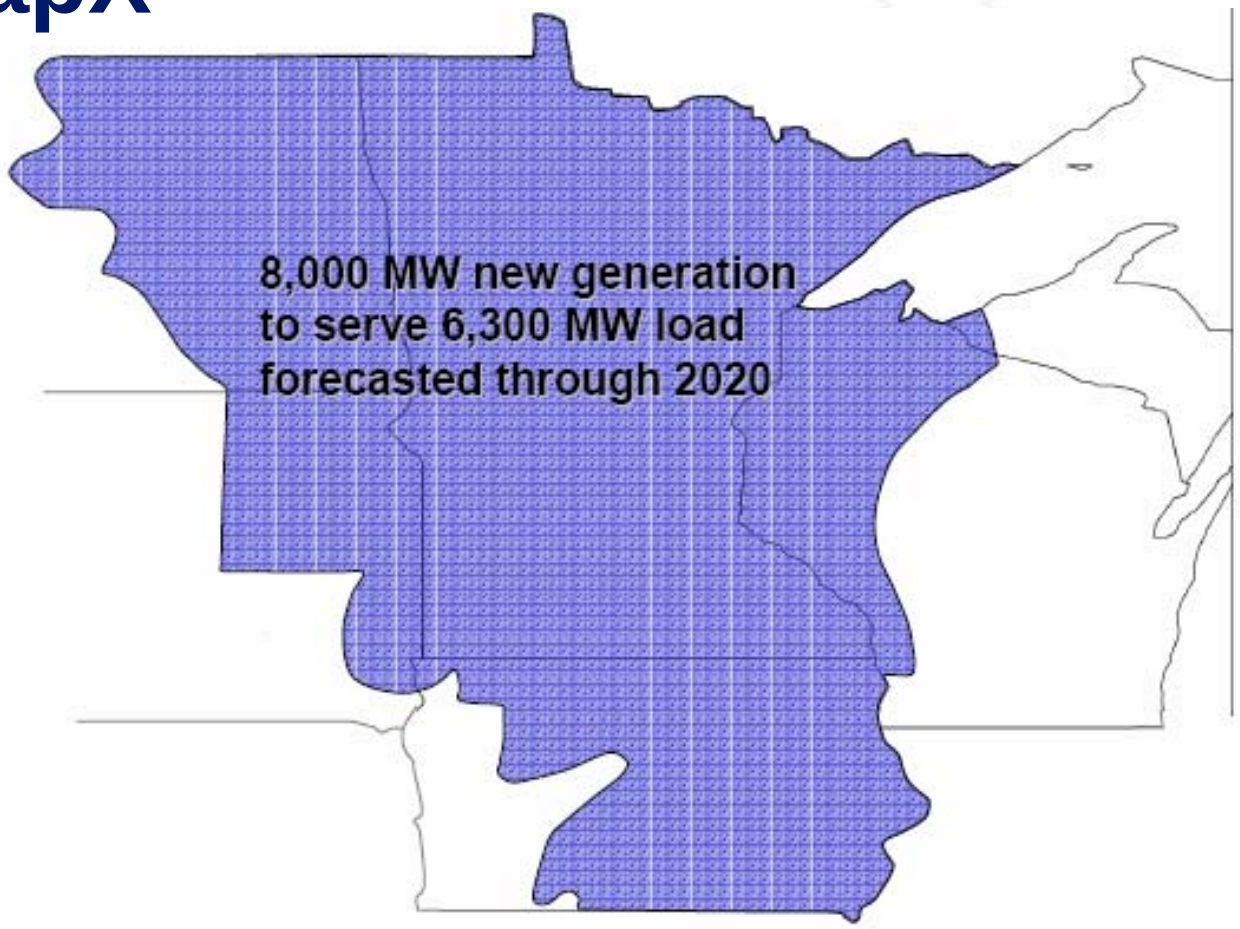
Missouri River Energy Services

Otter Tail Power Company

Southern Minnesota Municipal Power Agency

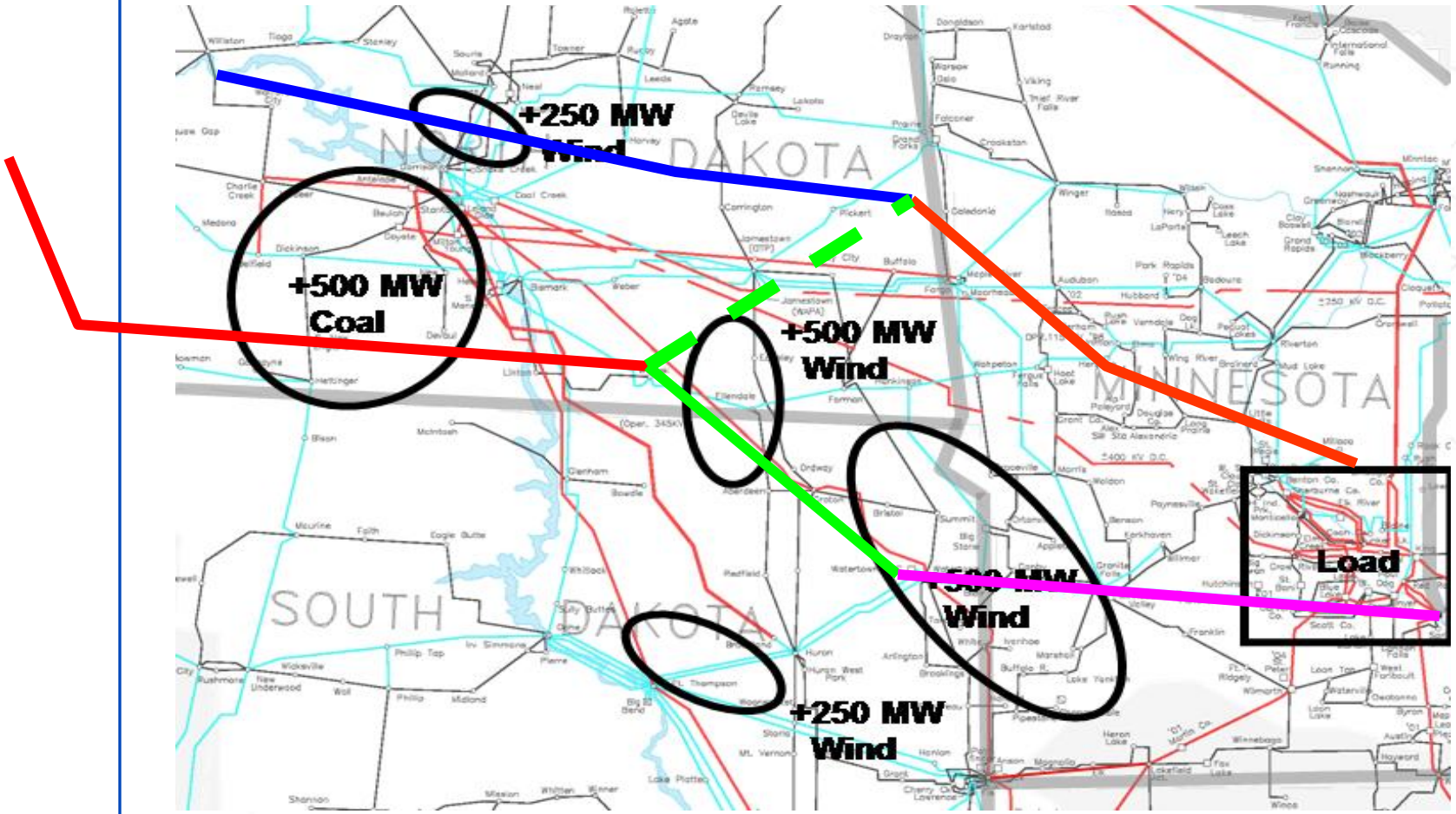
Xcel Energy

CapX

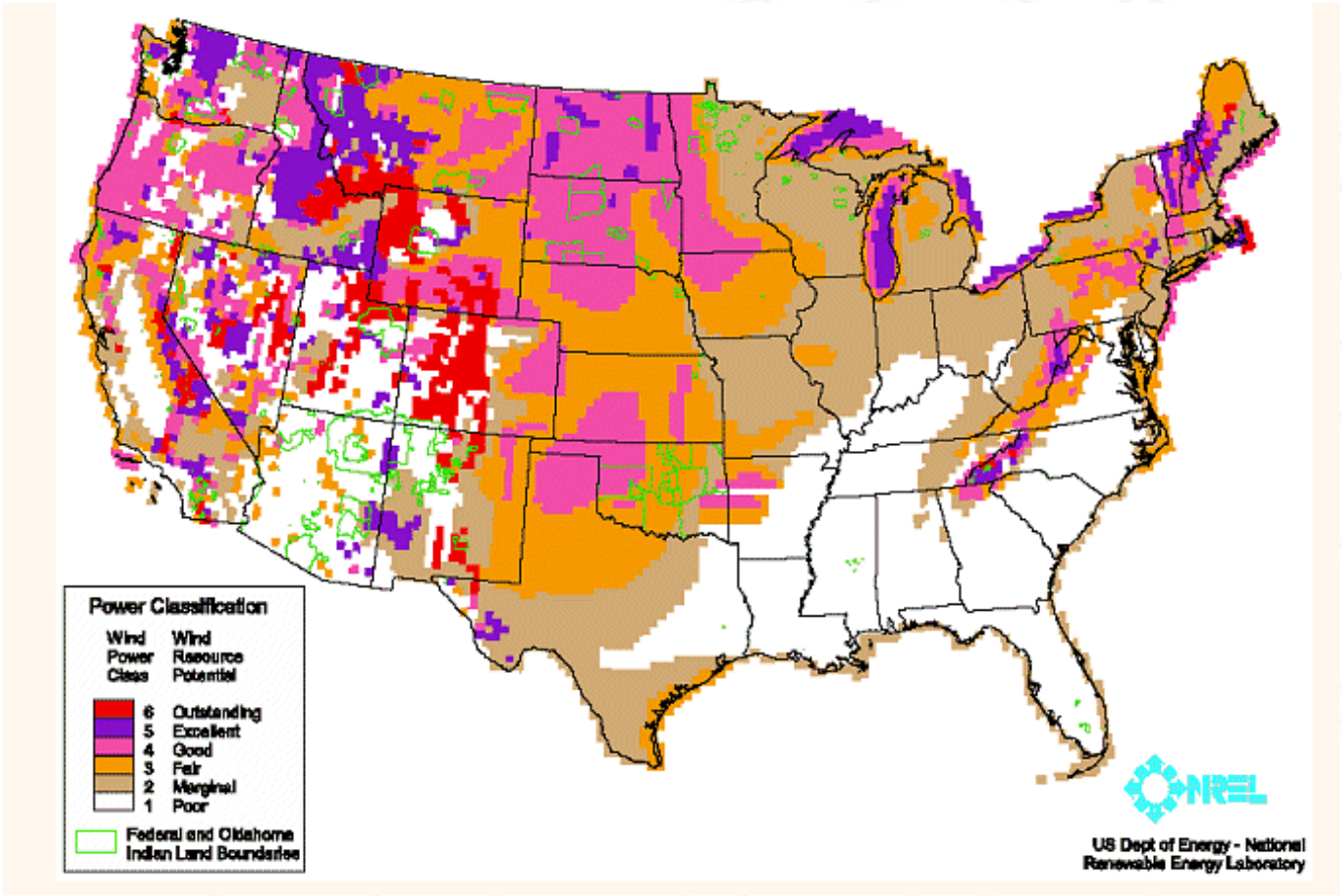


CapX Transmission Development Partners

CAPX Recommended Transmission Concept Plan



Wind Resource Potential



Big Stone Transmission Options

- MISO will run PROMOD for
  - 230 kV option
  - 345 kV option to integrate more closely with CAPX increases export from SD possibly for wind

Plan Summary

- MN Renewable Energy Objective 10%
  - Converts an option to a requirement
  - Transmission is being built
  - Allow recovery of the costs without a rate case
- MN to study the maximum amount of wind that can be accepted
  - Power to regulate load from other generation to match load and generation is a probable limit

Summary

- Develop load to use wind locally
  - Link and Sync- hot water and ice energy storage
  - Hydro storage
    - Ludington Pumped Storage 1800 MW
    - Manitoba
    - WAPA
- Use existing substations and lines
  - Locate wind by subs- MISO rate subs
  - Only a few substations are needed if a collector system is built connecting wind generation

Summary

- MTEP 06 will address a 10% REO for MISO
  - Wait
  - Perhaps MN study will increase level
- Work with neighbors (MN, IA) for capacity
  - Big Stone expansion
  - White Sub
  - Split Rock Sub
- Raise energy prices for wind energy
  - Use bi-lateral contracts and FTR's to secure low prices locally
  - Support export lines from MAPP to higher priced areas
  - Gas prices- gas on margin sets price levels